

REMARKS

Applicants respectfully request reconsideration and allowance of the above-captioned application.

Currently, claims 1-27 remain pending, including independent claims 1, 12 and 26. In general, the claims are directed to a method of monitoring web formation in a web forming process. The web can be, for instance, a paper product. As stated in the present specification on page 6, the term "formation" refers to the uniformity of distribution of fibers in the sheet that is formed.

In one embodiment, the method includes the steps of depositing a slurry of fibers upon a forming fabric. A light is emitted from a light source onto a first side of the wet web. The light reflected from the first side of the web is fed to a camera that forms a pattern of reflected light. A visual image is then formed of the wet web corresponding to the pattern of the reflected light.

Through the process of the present invention, a true two-dimensional, optical image of the formed web can be produced, stored and manipulated very early in the paper making process, prior to other process steps which can influence formation measurements. For instance, an operator can view the formed image prior to web completion and adjust various parameters in the web making system for improving the formation of the web.

In the Office Action, independent claim 1 was rejected under 35 U.S.C. §103 in view of Parker with or without Houston, et al. or Rule, Jr. or Bialkowski. Independent claim 12 was rejected under 35 U.S.C. §103 in view of the above same combination of references and further in view of admitted prior art allegedly contained in Applicants' own description. Independent claim 26 was rejected under 35 U.S.C. § 103 in view of Parker, as applied to

claim 1, and further in view of Bialkowski, and also rejected under 35 U.S.C. §103 in view of Parker and Houston, et al. or Rule, Jr. as applied to claim 1, and further in view of Bialkowski.

As an initial matter, it should be pointed out that nothing contained in Applicants' detailed description should be construed as an admission of prior art. In particular, it should be pointed out that Applicants' do not represent or admit that it would have been obvious to use a line scan camera such as the one described in the present application in a process for monitoring web formation.

Further, it is believed that the claims as now amended patentably define over the U.S. Patents cited in the Office Action. For example, the primary reference relied upon in the Office Action, Parker, fails to disclose various features and aspects of the present invention. For instance, Parker fails to disclose or suggest a method in which a visual image of a wet web is formed from reflected light. In addition, Parker fails to disclose or suggest the use of a camera, particularly a digital camera, for forming a visual image of a wet web.

Instead, Parker provides a method of analyzing variations in a moving web. The method includes: (a) repeatedly or continuously sampling variations in a characteristic of the web to produce a corresponding plurality of raw data signals; (b) determining a plurality of intermediate signals from the plurality of raw data signals; (c) calculating a power spectrum for each of the intermediate signals; (d) comparing a weighted or unweighted pair of the power spectra to produce a variation output; and (e) determining the variations in the sampled web characteristic according to the variation output. (Col. 3, lines 16-32.)

The system of Parker includes two or more 'lookers' which convert variations of reflectance or opacity to optical signals that are transmitted to a cabinet. Here the optical signals are converted to electrical signals which are sampled by a digital signal processing (DSP) board. A first computer, PC1, supervises and controls the activities of the lookers and the DSP board under the direction of a second computer, PC2. Typically, two signals are sampled for a period of about 30 minutes. At the end of the sampling period, the large numbers of Fast Fourier Transforms which have been calculated by the DSP are averaged, further processed by PC1 and sent to PC2. PC2 completes the analysis of the data and outputs the results to a VDU or printer. (Col. 5, line 66 – Col. 6, line 33.) The output from the system takes the form of tables, though graphs can be prepared from archived results and plotted to order (Col. 4, lines 17-22). Thus, at no point in the process does Parker form a visual image of the wet web.

Moreover, as stated in column 10, the function of a looker is to produce output signals, and in column 9, the signals that are produced are added or subtracted for predicting whether an unwanted variation exists in the web. As such, Applicants respectfully maintain that as opposed to the presently claimed invention, at no time does the system in Parker create a visual image that can be examined by an operator or otherwise analyzed.

In addition, though Parker states in column 6 that the exact design of the lookers is to some extent arbitrary and all that is required is a design which will allow detection of variations in light transmitted or reflected by the moving paper web, Applicants maintain there is no suggestion found that the lookers of Parker may be cameras. For instance, in the preferred embodiment discussed beginning in column 6, the image of the web is

focused on the ends of fiber optics, and the light from these fiber optics is directed onto photodetectors to obtain the electrical signals. In this embodiment, Parker is not forming an image of the web, as is produced in the present invention, but rather is focusing the image of the web on the ends of the fiber optics. Moreover, the photodetectors to which the light from bunches of fiber optics is directed are housed in the cabinet at the backside of the machine in a temperature controlled environment, and as such, Applicants respectfully submit that these photodetectors are not cameras at all, and specifically are not digital cameras as are taught in the present application.

Moreover, Applicants further submit that Parker actually teaches away from a combination with a system employing a line scan camera as is taught in the secondary reference Rule, Jr. Specifically, Parker states in column 4 at lines 60-64, that "in contrast to some prior art systems the monitor does not scan the web in the cross direction," and as such teaches away from the use of a scanning system.

Therefore, and at least for the reasons discussed above, it is believed that the claims patentably define over Parker alone or in combination with Rule, Jr.

It is further believed that the remaining cited references in the Office Action fail to cure the deficiencies of Parker and/or render obvious the presently pending claims. Specifically, none of the remaining cited references disclose or suggest light reflected from the first side of a web which is fed to a camera that forms a pattern of reflected light and forming a visual image of the web corresponding to the pattern of the reflected light.

For instance, as opposed to the presently pending claims, Rule, Jr. teaches a method in which light transmission variations are detected as opposed to reflections. In this regard, and as shown in the Figures, Rule, Jr. teaches a fiber optic light source and

linescan camera. However, for the invention of Rule, Jr., the fiber optic light source and linescan camera will be placed in a transmitted light configuration. (Col. 3, lines 1-6.)

Thus, Rule, Jr. teaches placing a plurality of lights on an opposite side of a sheet. In the claims of the present invention, however, light is transmitted and detected from the same side of the wet web.

Similarly, Houston discloses a formation tester that requires that a strobe light be positioned on the opposite side of a paper web from a camera. Similar to Rule, Jr., when analyzing formation, Houston teaches, “[t]o determine formation and blackening, the strobe light illuminates the web from one side of the web with the video camera directed at the opposite side of the web.” (Col. 3, lines 38-41.)

The remaining reference cited in the Office Action, Bialkowski, discloses an optical sensor for determining the location of the wet line of a paper machine. Bialkowski does not disclose a method for measuring paper formation as defined in the presently pending claims and does nothing to cure the deficiencies discussed above in Parker. As such, it is believed that the claims patentably define over Bialkowski either alone or in combination with Parker, Houston and/or Rule, Jr.

In addition, Applicants respectfully submit that even if taken in combination, absent any motivation to do so, the cited references still fail to disclose various features and aspects of the present invention. For example, none of the references teach a method of forming a visual image of a web wherein the web comprises a water content of at least about 80%, as taught in dependent claim 8, or a water content of between about 80% and about 95%, as taught in claim 9. Additionally, none of the cited references teach a method of forming a visual image of a web which is formed on a dark or black forming fabric, as is

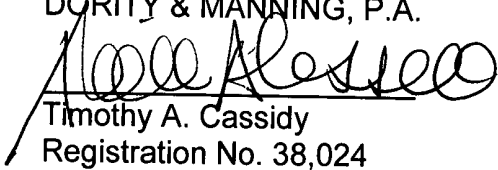
taught in dependent claims 11 and 23-25. In addition, a method such as that of dependent claim 14 is not taught in any reference, in which a computer processor compares signals received from a camera with predetermined stored values to determine the degree of deviation of the formation of a paper web from desired paper web formation values. In yet another example, none of the cited references disclose certain aspects of the method of independent claim 26, such as, for example, wherein web making parameters are adjusted based upon a formed visual image of the web in order to improve the web formation.

In summary, it is respectfully submitted that the claims as presently pending patentably define over the prior art of record. It is believed that the present application is complete condition for allowance and favorable action, therefore, is respectfully requested. Should any issues remain after consideration of this Amendment, however, Examiner Alvo is invited and encouraged to telephone the undersigned at his convenience.

Please charge any additional fees required by this Amendment to Deposit Account No. 04-1403.

5/1/03
Date

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